

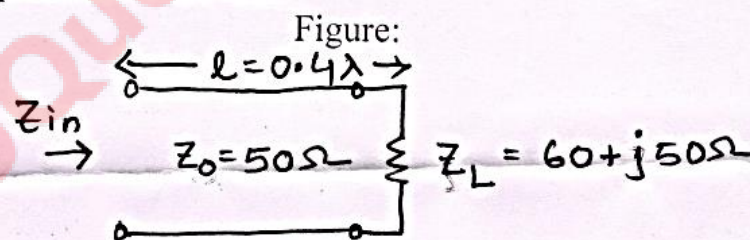
GUJARAT TECHNOLOGICAL UNIVERSITY**ME – SEMESTER –I-(New) EXAMINATION – WINTER 2019****Subject Code: 3710514****Date: 13/05/2019****Subject Name: RF and Microwave Circuit Design****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain all the properties of S Parameter in multiport network. **03**
 (b) Differentiate T and Π matching networks **04**
 (c) Find the width for a 50 ohm copper strip line conductor with $b=0.32$ cm and $\epsilon_r=2.20$. If the dielectric loss tangent is 0.001 and the operating frequency is 10 ghz, calculate the attenuation in dB/ λ . Assume a conductor thickness of $t=0.01$ mm. **07**
- Q.2** (a) Derive Z-parameters in terms of ABCD parameters. **03**
 (b) What are the different applications of Microwave? **04**
 (c) A three port circulator has an insertion loss of 2 dB, isolation 40 dB and VSWR=2.0. Find the S-Matrix. **07**

OR

- (c) Why we need to design matching network? Explain Single Stub and Double Stub matching Network. **07**
- Q.3** (a) Write short notes on 3 dB attenuator. **03**
 (b) Explain Low noise amplifier design, **04**
 (c) Use the Smith chart to find the following quantities for the transmission line circuit below: i>SWR II>Reflection coefficient at the load. iii>load admittance. Iv> the input impedance of the line. **07**

**OR**

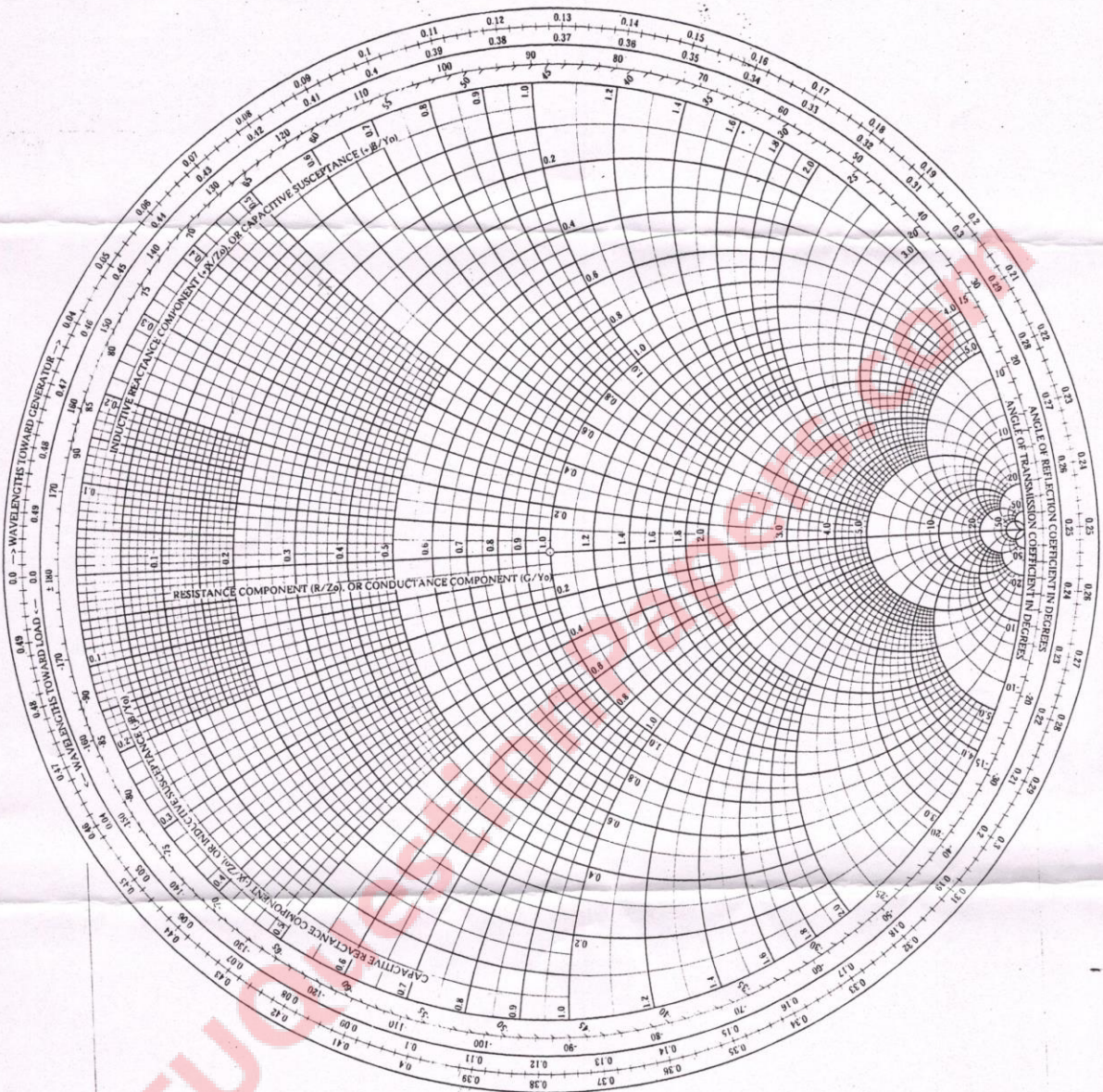
- Q.3** (a) Explain Gunn effect in Gunn diode. **03**
 (b) Write short notes on IMPATT diode. **04**
 (c) Explain in detail the principle of operation of Pin Diode. **07**
- Q.4** (a) Write short notes on Schottky diode. **03**
 (b) Write short notes on Microwave Bends and corners. **04**
 (c) Explain Balanced Microwave amplifier. **07**
- OR**
- Q.4** (a) Write short notes on Gyrator. **03**
 (b) What are the materials used in the fabrication of MMIC? **04**

	(c)	Explain Construction and application of circulator.	07
Q.5	(a)	Write short notes on Cylindrical Cavity Resonator.	03
	(b)	Write short notes on T Junction Power divider.	04
	(c)	Write short notes on GaAs FET and HEMT.	07
OR			
Q.5	(a)	Write short notes on Ring Hybrid coupler.	03
	(b)	How microwave impedance is measured?	04
	(c)	Explain Lange Coupler.	07

GTUQuestionPapers.com

The Complete Smith Chart

Black Magic Design



RADIALLY SCALED PARAMETERS

SWR	dBS	RETN LOSS (dB)	REFL COEFF P	REFL COEFF V	TOWARD LOAD →	← TOWARD GENERATOR	ATTEN (dB)	RETN LOSS COEFF	SWR	REFL COEFF P	REFL COEFF V	TRANSM LOSS COEFF
100	40	20	0.9	0.8	10	1	1.0	0.01	10	0.9	0.8	0.01
20	20	10	0.7	0.6	5	2	0.5	0.04	5	0.7	0.6	0.04
10	10	5	0.5	0.4	3	3	0.3	0.09	3	0.5	0.4	0.09
5	5	3	0.3	0.2	2	4	0.2	0.16	2	0.3	0.2	0.16
2.5	2.5	1.5	0.1	0.05	1.5	5	0.1	0.36	1.5	0.1	0.05	0.36
2	2	1	0.05	0.02	1.2	6	0.05	0.49	1.2	0.05	0.02	0.49
1.8	1.8	0.8	0.02	0.01	1.1	7	0.02	0.64	1.1	0.02	0.01	0.64
1.6	1.6	0.6	0.01	0.005	1.0	8	0.01	0.81	1.0	0.01	0.005	0.81
1.4	1.4	0.4	0.005	0.002	1.0	9	0.005	1.00	1.0	0.005	0.002	1.00
1.2	1.2	0.3	0.002	0.001	1.0	10	0.002	1.21	1.0	0.002	0.001	1.21
1.1	1.1	0.2	0.001	0.0005	1.0	15	0.001	2.25	1.0	0.001	0.0005	2.25
1.1	1.1	0.1	0.0005	0.0002	1.0	20	0.0005	4.00	1.0	0.0005	0.0002	4.00
1.0	1.0	0.0	0.0002	0.0001	1.0	30	0.0002	9.00	1.0	0.0002	0.0001	9.00
1.0	1.0	0.0	0.0001	0.00005	1.0	∞	0.0001	∞	1.0	0.0001	0.00005	∞

ORIGIN